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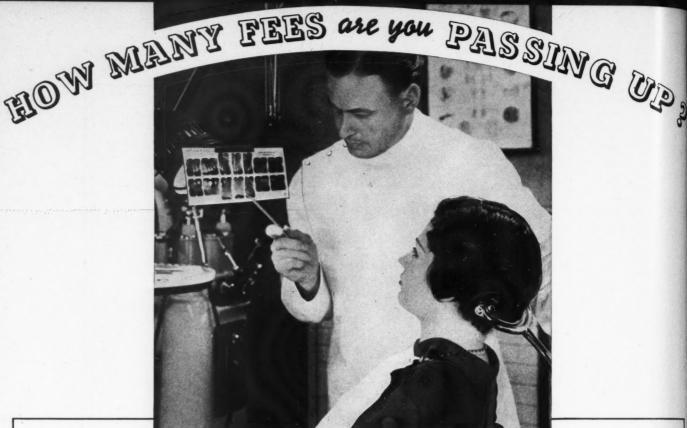
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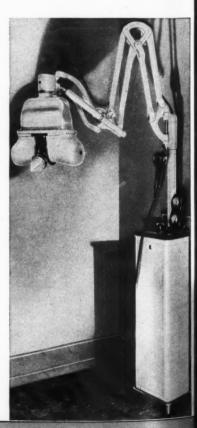
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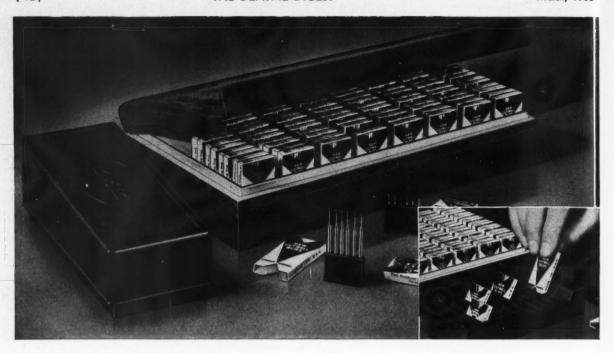
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The DENTAL DIGEST

VOLUME 42

March, 1936

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A DUAL TECHNIQUE IN PULP THERAPY

J. P. CARMICHAEL, D.D.S. Los Angeles

ITH the discovery of focal infection many physicians regarded teeth only sources of infection and as of no biologic value. Thousands of people were the victims of this ignorant assumption, because dentists unfortunately were not scientifically equipped to combat the loss of teeth that might have been saved. Today, however, a different condition exists. Scientific knowledge has been developed and means are at hand to treat and save many teeth that heretofore might have been lost. The dental profession at one time allowed the physicians to dictate the attitude toward the retention of teeth. This situation operated to the detriment of everybody concerned. It is now time for dentists to assert their privileges and fulfill their responsibility to their patients by insisting that the dentist, and not the physician, be the one who determines whether a diseased tooth should or should not be extracted. It is a fact that teeth do become irreparably involved, and the retention of such teeth is not being advocated here.

It is no longer necessary even to consider the extraction of a tooth simply because the pulp is exposed or diseased. A treatment is available which redeems such a tooth and restores it as a useful member of the masticating mechanism.

The technique suggested here involves no secret formula.

The remedies may be compounded by any good pharmacist according to the prescriptions herein given.

PULP THERAPY

The real problem in pulp therapy is the prevention of periapical infection. An exposed or infected pulp must be so treated that the infection does not involve the investing tissues of the tooth. In other words the infection or disease must be cured, or eradicated, within the area occupied by the pulp tissue. This can be done if a few simple scientific procedures are rigidly followed.

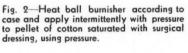
When infection is known to be the cause of disease, that cause must be removed by sterilization or surgery. This treatment must be accomplished with the least possible harm

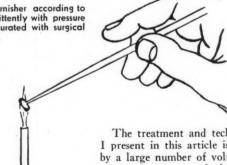
Fig. 1—"Difuseptic" pulp capping with asbestos covering being molded to place with warm instrument

to living tissue and to the natural forces of resistance. Conditions must be established which will maintain sterility or guard against reinfection.

Diseases of the pulp are primarily the result of infected dentine. The pulp may become infected or diseased in advance of actual exposure or the invasion of outside bacteria. Pulp capping and even root canal operations have failed because no definite procedure has been used to sterilize or remove this infected dentine. Sterility has not been attained and no measures have been instituted to maintain a sterile tranquil condition around the pulp or in the pulp canals in cases of pulp removal. Pulp therapy has failed because the methods used have done nothing more than seal over or seal into the exposed pulp infectious materials which produce an ideal condition for the further development of infection.

Pulp therapy has two primary objectives: First, the agents employed must reach the entire diseased or infected area and sterilize the parts involved without undue irritation or permanent harm. Second, measures must be employed that will permanently maintain sterility and tranquillity of the tissues involved. These two objectives are accomplished by two separate techniques; hence the name, a "Dual Technique."





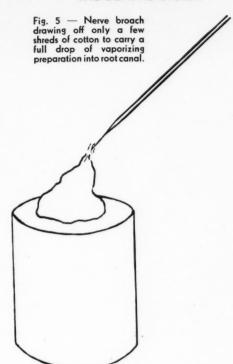
The treatment and technique that I present in this article is supported by a large number of voluntary case reports sent to me during the past fifteen years. In addition I have my clinical experience of more than twenty years. Extensive laboratory examinations made by a biologic laboratory proved that the formulas here submitted will do exactly what is claimed for them.



Fig. 3—Sterilizing infected dentine. Preliminary to capping or opening into pulp chamber.



Fig. 4—Use a flame-shaped bur to form seat for the vaporizing instrument.



Sterilization - Bacterial activity must be combated from the beginning of caries to apical rarefaction. The difficulty has been to sterilize the tissue involved in pulp disease. A vapor sterilization can be made to penetrate not only diseased tissue but also the intercellular tissue throughout, which has become disorganized by the infective process; thus, the entire area involved is sterilized. Repeated sterilization can be done before the operative procedure in the removal of caries, infected pulp, or diseased tissue, without the least danger of over-treatment. This sterilization also eliminates the possibility of forcing infection in advance of the operation.

To attain sterility, a highly volatile germicidal agent, known as "Vapocide,"* is used in the cavity or pulp chamber and volatilized with a hot vaporizing instrument designed to imprison the vapor. In root canal operations the corked in vapor is driven throughout the channels into the apical area, sterilizing not only the rarefied area but the infected intercellular tissue as well. The action is instantaneous, being completed within a few seconds. It does not persist over a long period of time, thus any danger from delayed irritation is mini-

*Vapocide:

Eucalyptol ... 0.616 cc
Thymol ... 0.648 Gm.
Oleum pinus pumilionis ... 1.5 cc.
Methyl salicylate ... 0.616 cc
Glycerin ... 15.0 cc.
Formaldehyde (40%) ... 120.0 cc.
(In a suitable vaporizing base containing 25% alcohol)

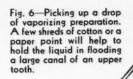




Fig. 7—After flooding, heat bulb of vaporizing instrument red hot; set quickly to place and count 1-2-3; repeat often. In putrescent conditions or rarefaction reflood and repeat in some cases two or three times.

mized. Clinical evidence that the apical area is made sterile by this treatment is found in the fact that root canals are filled immediately after pulp extraction and that soreness does not follow the operation. Radiolucent areas do not later develop, because sterility and tranquility are maintained.

Maintaining Sterility—Following vapor sterilization a diffusible all-mineral antiseptic surgical dressing material is used, called "Difuseptic."**

Iodoform, heavy	Difuseptic Paste:	
Barium Sulphate 60 G Ferric oxide, anhydrous 1.286 G Zinc oxide 60 G Hard paraffin (Czecho-Slovakian) 73.75 G Chloroform 30	Iodoform, heavy 60	Gm
Ferric oxide, anhydrous 1.286 G Zinc oxide 60 G Hard paraffin (Czecho-Slovaklan) 73.75 G Chloroform 30		
Zinc oxide 60 G Hard paraffin (Czecho- Slovakian) .73.75 G Chloroform .30		
Hard paraffin (Czecho- Slovakian)	Ferric oxide, anhydrous 1.286	Gm
Slovakian)		Gm
Chloroform 30	Hard paraffin (Czecho-	
Aromatics		
	Aromatics	q.8

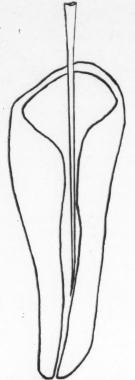
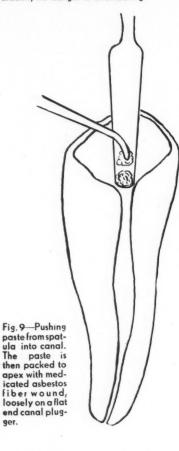


Fig. 8—Hold flame near piano wire, heat red hot and quickly carry to full length of canal to volatilize remaining vapor preparation; no danger of overheating.



This material will permanently maintain sterility, making decomposition impossible. It is inactive except in the presence of putrefying bacteria. It will then evolve iodine vapor which is antiseptic in the proportion of 1 to 3000. Iodine vapor will penetrate to the depths of infected tissue and will maintain sterility of nonvital dentine or bone without causing discoloration or other harm to living tissue. This surgical dressing is conducive to bone regeneration. Since its introduction in root canal therapy, it is used extensively in bone surgery. It is made into paste form by combining it with "Medisol" (a medicated excipient†). This is done by the operator to form any consistency desired.

Use in Hypersensitivity-The vaporizing technique is ideal in the treatment of hypersensitivity. Without removing the mass of decay, sterilization with the vaporizing preparation will completely arrest the acid bacteria action.

1. After removal of soft decay a pledget of cotton saturated with the vaporizing preparation is placed.

2. Heat and pressure are applied over the cotton with a hot instrument. This is done intermittently and cautiously; the anodyne action will allay any pain that may be caused by the heat.

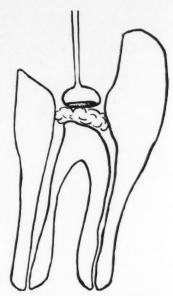
3. The decay is then covered to the enamel margin with the paste preparation, and the cavity is sealed with a zinc oxide filling.

4. After ten days, two weeks, or any convenient time, it will be found that the pulp hyperemia has entirely subsided, and the cavity can be excavated to the vital dentine without pain.

5. To maintain pulp normalcy a caplet of the paste preparation is used and covered with cement.

Arrest of Dentinal Infection-How to arrest a deep infection in the dentine before it has reached the pulp has always been a problem. This problem becomes more difficult after the pulp is definitely infected but not actually exposed. The vaporizing preparation is applied in the cavity by saturating a pledget of cotton of suitable size with the drug; then by means of a hot vaporizing instrument over the cotton pledget a vapor is created which penetrates diseased tissue and sterilizes even the uttermost parts of the infected tissue. This operation is followed by sealing a caplet of the surgical dressing over the floor of the cavity.

†Medisol: A medicated excipient with a chloroform base and essential anti-



Pledget of cotton saturated with surgical dressing; red hot ball burnisher used in sterilizing vital or putrescent canal pulp in advance of operative procedure.

Determining Degree of Pulp Vitality-The vaporizing treatment provides an accurate measure of determining the degree of pulp vitality. During excavation of a deep seated cavity in the first permanent molar, for instance, the cavity is saturated with the vaporizing preparation, and intermittently the floor of the cavity is touched with a hot ball burnisher. If there is a congested pulp there will be little or no response to a red hot ball burnisher when touched at the nearest approach to the pulp.

Clinical proof of the efficiency of this treatment will be found in the sterilization of a badly infected exposed pulp covered with the antiseptic surgical dressing described. In twenty-four hours the pulp organ will often contract to the extent that it will only partly fill the pulp chamber, which is proof of established circulation and normal physiologic

function.

SUMMARY AND CONCLUSIONS

1. Sterilization in advance of all root canal operations is important, and it is effected through the use of this vaporizing treatment.

2. The antiseptics used are sufficiently active, even in liquid form, to sterilize thoroughly the cavity and the pulp chamber, and all danger of mechanically forcing infection in advance of the operation is eliminated.

3. The first treatment will render inactive all bacteria within the canal. This is the paramount consideration, as my experience has convinced me that any infected reaction in the apical area is due to the action of the established bacteria rather than to any invading organisms. Even if such infection could come from outside sources, it would be impossible for it to penetrate the defense set up by an application of this treatment.

4. The surgical dressing for wounded tissue provides an effective root canal filling in either a wet or dry state. In case of a freshly removed pulp the mix is made dry in order that it may be packed firmly to the foramen without forcing it through the apex and causing pain. The excess medicated excipient is extracted from the mix with a cotton roll.

5. If there are multiple foramina, they are all made sterile by vapor sterilization.

6. If the case is that of a putrescent pulp or apical rarefaction two or even three vapor treatments are made at one sitting, and the cavity is filled immediately with the paste preparation. This treatment prevents the development of an acute exacerbation from a chronic infection.

7. The operator must guard against forcing air in advance in all root canal procedures.

8. The cavity is carefully flooded with the vaporizing preparation before using the vaporizing instrument.

9. A few shreds of cotton on a nerve broach will carry a drop into the canal of an upper tooth.

10. Vapor will pass through a stricture in a tortuous channel and sterilize any remaining infectious mat-

ter. In some cases, it is naturally impossible to fill the canal below a particularly tortuous structure. Such cases, however, are successfully controlled by the vaporizing therapy as the diffusion of the active antiseptic in this filling material will combat infection in the canal beyond the point to which the filling material has reached; it further combats any reinfective process by the diffusion of the residual antiseptic contained in the permanent filling; thus the infective process is effectually checked; natural processes are encouraged to go on to regeneration. Numerous cases showing rarefaction have been intentionally overfilled to show a considerable "button" of the paste beyond the apex, with satisfactory results.

11. Vaporizing therapy obviates the need for repeated treatments, and consequently, repeated intervention. The common and dangerous practice of pumping medication into the canals is likewise made unnecessary. Repeated treatments and pumping medication into the canals often result in periapical disturbance.

12. In pulp surgery the operator should bear in mind that he is dealing with the pulp organ whether it is an operation of capping the pulp proper or capping the pulp fiber at the root apex. The treatment of the wounded tissue at the apex is the same as that involved in covering the wounded tissue of an exposed pulp.

13. To sterilize an exposed pulp, it is covered with a layer of cotton

saturated with the warm vaporizing preparation. The heat is intermittently applied over the saturated cotton with a hot ball burnisher, preferably a concave burnisher.

14. This preparation when volatilized produces a vapor nine times more powerful than in the liquid form and possesses remarkable penetrating properties. This formula when properly compounded eliminates all the irritating properties of formaldehyde.

15. The pulp capping material has a paraffin base and is spread on asbestos paper. It can be molded perfectly to a wounded pulp with a warm burnisher. The analgesic properties will allay pain owing to accidental exposure.

16. In operations involving a bleeding pulp or blood flowing from the canal following pulp extraction, sterilization and the operation itself are completed at one sitting.

17. The proper surgical procedure in the treatment of any wound is to dress the parts involved at the time they are sterile and then pack the wound with an agreeable surgical dressing that will give nature a wall against which to build. Sterile blood or serum does not interfere with completing the operation following vapor sterilization.

18. All treatments to check hemorrhage are harmful. The use of cresol and other escharotics cause scar tissue and slough; therefore they should not be used.

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THE REMOVAL OF FRACTURED ROOTS APPROXIMATING THE MAXILLARY SINUS

RALPH W. EDWARDS, D.D.S.

Kansas City, Missouri

F ALL the complications attending the practice of exodontia, probably one of the most distressing is that of the root that has been forced into the maxillary sinus. This misfortune necessitates an operation on the sinus for the removal of the fractured root. If the proper approach is made to the problem of root removal, the mishap can be prevented. In an investigation of 147 cases of root fragment in the maxillary sinus, the observation is made that in the majority of instances the root fragment is the lingual root of an upper first or second molar. The usual history given in these cases is that the tooth was fractured in the process of extraction, and when an attempt was made to remove the root with an elevator, it "disappeared."

In the attempt to remove a root fragment from its alveolus, the following facts should be given consideration: (a) Ample access to the socket must be obtained; (b) sufficient bone structure must be removed from around the root to permit its delivery. It is lack of attention to these details that results in the forcing of a root into the sinus when an attempt at removal is made with an elevator.

Access to a fractured root through the orifice of the socket is unsatisfactory, owing to the limitations of the opening and the interference of bone structure surrounding the root. Access, therefore, must be obtained by retraction of tissue and removal of bone substance.

TECHNIQUE

1. It is necessary, before attempting to remove any root fragment, to have a correct roentgenogram of the

2. In the instance of the fracture of the lingual root of an upper molar (Fig. 1), an angular incison is made over the medial adjacent tooth (Fig. 2), and the tissues retracted.

3. A sufficient amount of the buccal plate of process is removed to afford proper instrumentation within the socket.

4. The interradical septum of alveolar process (Fig. 1) is removed Tenth Street and Troost Avenue.

-A, Fractured lingual root of upper first molar; B, interradical septum of alveolar

process to be removed in order to free fractured root.

Fig. 2—Incision over medial adjacent tooth preparatory to retraction of tissue.

Fig. 3—Tissue retracted and portion of buccal plate removed to afford instrumentation within the socket. Interradical septum has been removed. Fig. 4—Thin concave blade elevator (No. 34s) for displacing fractured roots after root has been relieved of supporting bone substance

Fig. 5—Fractured root has been delivered into space created by removal of interradical

septum, and removed from socket. Fig. 6—Flap replaced and sutured with No. 00 catgut.

with chisel and mallet to the extent that the root fragment is exposed and no longer completely encircled with bone (Fig. 3).

5. A thin concave blade elevator (Fig. 4) is ideally suited for displacing roots that have been relieved of supporting bone. Utilizing the lingual plate of the socket as a support, the elevator is placed between the lingual alveolar plate and the root; the root is delivered into the space created by the removal of the interradical septum, and then removed from the socket (Fig. 5).

6. An important consideration after removal of the root from the socket is that of freeing the area from loose and partly attached bone fragments, and smoothing any irregularities in the bone against which the flap must

7. No. 00 catgut is used for suturing the flap (Fig. 6).

COMMENT

The frequency with which root fragments are forced into the maxillary sinus should emphasize the necessity of surgical removal of all maxillary teeth with widely divergent roots.

When roots are fractured, no attempt should be made at removal until access has been obtained to the interior of the socket and sufficient bone has been removed from the root.

A MASTER MODEL TECHNIQUE FOR THE CONSTRUCTION OF INLAYS, CROWNS, AND BRIDGEWORK

E. E. BAILEY, D.D.S.

Denver

HE master model technique presented here is well adapted to operations for opening the bite and to the construction of porcelain jacket crowns and all porcelain bridgework. A complete discussion follows for an occlusal reconstruction

operation. From this, it will at once be apparent how the procedure can be adapted to all types of restorative operations. In this article, for convenience, the subject is divided into the following subdivisions: (1) The Technique of Mounting the Stone Study Casts in the Open Centric Relationship; (2) Securing Centric Relation; (3) The Use of the Occlusal Positioning Guide; (4) The Method of Constructing Positioning Guide with Metal or Wax; (5) The Technique of Construction and the Use of

Fig. 1—Initial mounting of study casts. A, Facebow mounting of maxillary cast; B, mandibular cast articulated with the help of worn facets, and mounted; C, adjustment of condylar paths of articulator. D through L, Construction of bite-blocks for mounting study casts in position found at time of diagnosis. D, Opening bite on articulator to meet mechanical requirements of case; E, adapting 60-gauge tinfoil to occlusal half of bicuspids and molars; F, maxing trough with damp napkins and pouring low-fusing alloy; G, patting to place with finger; H, shaping with hot spatula; J, establishing point of contact on each side in bicuspid region; K, use of small bite-blocks to permit open vision; L, testing to be sure contact is even on each side preparatory to taking bite.

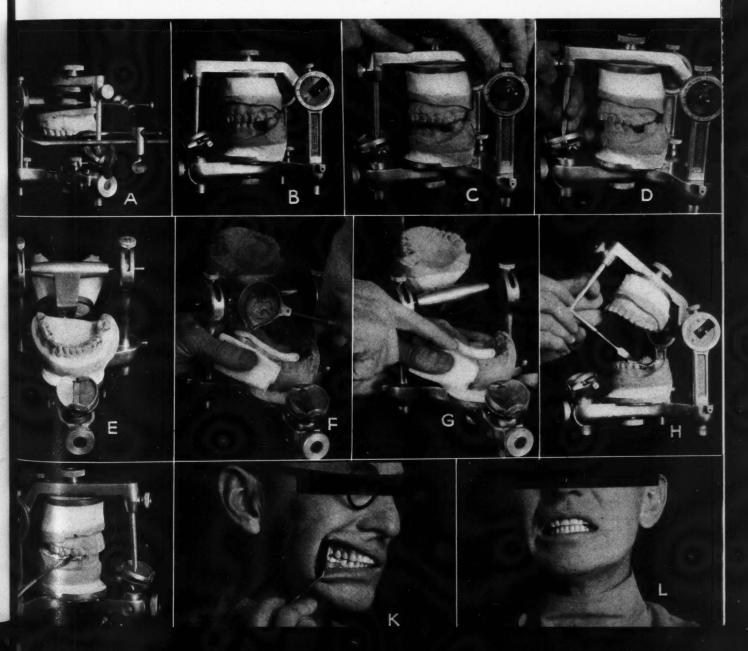




Fig. 2—Securing bite and remounting upper cast. A, Placing bite-blocks on cast, adapting strip of baseplate wax, and covering with 40-gauge tinfoil; B, bite-block with wax covered with 40-gauge tinfoil, which is softened in warm water; C, securing bite by having patient close to contact with bite-block; D, finished registration of bite; E, remounting of upper cast; F, study casts in position in which case is to be constructed.

Temporary Inlays and Crowns; (6) The Construction of Amalgam Dies; (7) The Function and Construction of Transfer Inlays and Crowns; (8) The Master Impression; (9) Construction of the Case.

THE TECHNIQUE OF MOUNTING THE STONE STUDY CASTS IN THE OPEN CENTRIC RELATIONSHIP

1. At the time the impressions are secured a facebow transfer is made and the protrusive checkbite is taken (Fig. 1, A). It is not necessary to take the centric bite at this time inasmuch as the primary mounting is done with the help of the worn facets of the cusps.

2. The upper cast is mounted with the facebow transfer. The mandibular cast is articulated and mounted (Fig. 1, B).

3. The condylar guides are adjusted to a protrusive checkbite (Fig. 1, C).

The object in first mounting the study casts to the patient's bite is to observe the existing condition from which to determine the degree of opening necessary to make the proposed correction.

4. The bite is opened on the articulator to the point that meets the mechanical requirements (Fig. 1, D). It should be understood that this is only a step in arriving at the correct vertical height. Whereas the mechanical requirements are determined on the instrument, the patient must be studied for the esthetic requirements.

5. Then, the mechanical and esthetic factors must be brought into harmony. This is done by building metal bite-blocks on the study casts to register the proposed opening. When transferred to the mouth the blocks will hold the jaws in the same vertical relationship as that occupied by the study casts.

6. The metal bite-blocks are built by adapting 60-gauge tinfoil over the occlusal half of the bicuspids and molars of the mandibular cast (Fig. 1, E).

7. A trough is made over the occlusal half by holding a folded damp napkin on each side of the tinfoil (Fig. 1, F).

8. Low-fusing alloy is poured and patted to place with the finger (Fig. 1, G).

9. With a hot spatula, metal is built on or taken away until the articulator guide-pin registers centric relation (Fig. 1, H).

10. With a large vulcanite bur and carborundum discs the occlusal surface is finished so that only the points of the cusps in the bicuspid region are touching (Fig. 1, J). This is necessary because there must be no indentations to deflect the bite.

SECURING CENTRIC RELATION

The opening, up to this point, is arbitrary. The centric relation, therefore, must be registered by the patient before it can be accepted as accurate.

1. The bite-blocks are placed in the mouth and carefully checked to see that contact is even on the two sides when the jaws are closed. At this point the final study of the case is made to coordinate the mechanical requirements with the esthetic.

2. If the opening must be modified, the blocks are replaced on the instrument; the guide-pin is set to the desired opening; the bite-blocks are adjusted to contact, and the opening is again checked in the mouth.

3. A double thickness of base-plate

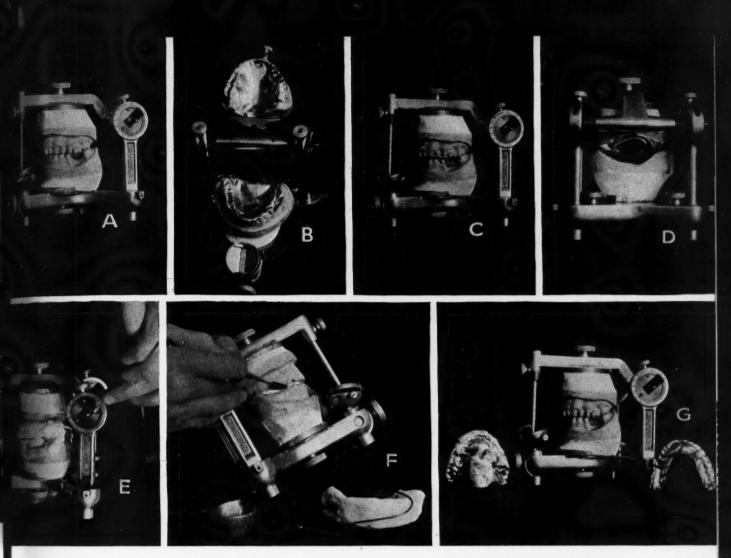


Fig. 3—Occlusal positioning guide of alloy. A, Study casts in position found at time of diagnosis, ready for construction of occlusal positioning guide; B, adapting 60-gauge tinfoil; C, instrument closed to centric relation; D, posterior view, showing manner of shaping tinfoil to direct alloy between teeth; E, outer opening walled off with moist cotton and low-fusing alloy poured; F, adding or removing alloy with hot spatula in finishing buccal and labial surfaces; G, occlusal positioning guide (1) before trimming; (2) occlusal positioning guide finished.

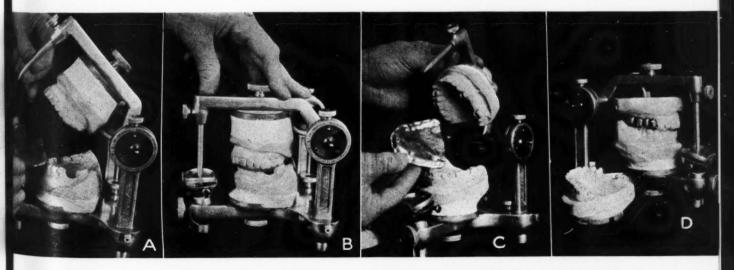


Fig. 4—Construction of occlusal positioning guide of wax covered with tinfoil. A, Baseplate wax covered with 40-gauge tinfoil, prepared and softened in warm water; B, placing in position and closing instrument to occlusion. Incisal guide table is set horizontally to prevent the spring of the instrument when force is used in closing the articulator. C, Finished occlusal positioning guide; D, application. The master cast takes the place of the study cast in the occlusal positioning guide.

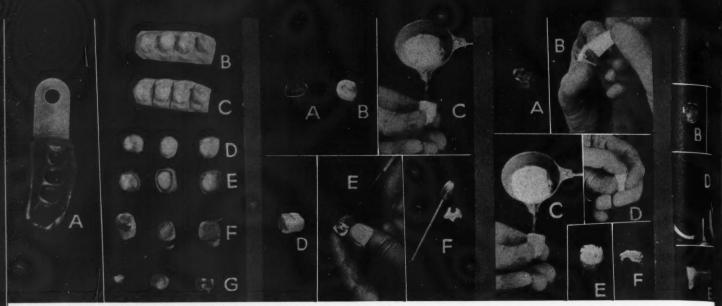


Fig. 5 Fig. 6 Fig. 7

Fig. 5—Temporary restoration of alloy on plaster cast, group technique. A, securing impression in compound; B, cast of accelerated plaster; C, cast sectioned with saw; D, plaster tooth carved so that gum-line will form shoulder to create space between paper matrixes and side walls of plaster tooth, for constructing crowns and three-quarter crowns; E, paper matrixes in place; F, alloy poured and pressed to place with finger; G, finished temporary case.

Fig. 6—Low-fusing alloy inlay for single tooth. A, Band impression (or impression taken with compound in fingers); B, cast made with quick-setting plaster; C, adapting paper matrix and pouring alloy, which is pushed to place with finger; D, inlay as cast on plaster tooth; E, shaping with hot spatula; F, finishing burs and discs.

Fig. 7—Low-fusing alloy temporary inlays on copper amalgam dies. A, Copper amalgam die; B, placing paper matrix around die; C, pouring alloy; D, casting with finger; E, inlay ready for finishing; F, finished temporary inlay.

Fig. 8—Low-fusing alloy temporary crowns on copper amalgam dies. A, Die wrapped with 60-gauge tinfoil; B, tinfoil trimmed and adapted to gingival margin; C, occlusal portion filled with alloy; D, spreading alloy over side walls with hot spatula, and shaping; E, crown ready for finishing with burs and discs; F, finished crown.

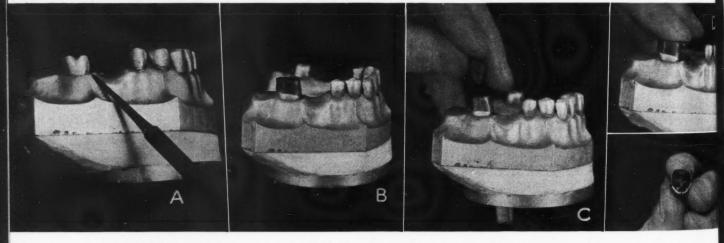


Fig. 9—Band impressions for inlays. A, Area indicated by pointer must be closely adapted with band to prevent compound from flowing into undercuts, B, soft copper band, correctly adapted, covering only surfaces parallel or convergent to cavity walls, C, compound heated to working consistency throughout and pressed into cavity; D, finger used to force compound to place; E, finished impression, which should show a clean-cut impression of margins.

wax is placed on the occlusal surfaces of the bite-blocks and covered with 40-gauge tinfoil (Fig. 2, A and B).

4. The bite-blocks are placed in water of the correct temperature to soften the wax, and the bite is secured by having the patient close to contact with the bite-blocks (Fig. 2,

5. The upper cast is remounted to the corrected bite (Fig. 2, E).

THE USE OF THE OCCLUSAL POSITIONING GUIDE

The study casts have been mounted

in the position in which the case is to be built. Later, master casts, containing dies of teeth to be restored, will be constructed.

1. To mount the master casts accurately in the position that the study casts occupy, an occlusal positioning guide is built to register the centric relationship that the study casts occupy on the articulator. This positioning guide is constructed of metal (Fig. 3) or of base-plate wax covered with 60-gauge tinfoil (Fig. 4). The positioning guide should touch only the tips of the incisal and oc-

clusal surfaces of the teeth on the study casts, because these points remain reasonably constant whether on the study or master casts. A master cast, therefore, can be seated in the occlusal positioning guide and mounted to the opposite study cast.

Some portions of the teeth will, of course, be reduced in cavity preparation. There is usually, however, at least one tooth on each side of the arch which presents an unchanged cusp to balance the master cast in the guide. Inasmuch as the incisors are not restored until the posterior teeth



Fig. 10—Impression for crown. A, Soft 32-gauge copper band fitted tightly and festooned to exact position crown is to occupy; B, band in position to receive heated compound which is forced to place; C, band giving impression of gingival margin and side walls; the compound takes only the occlusal impression and that of a small portion of the side wall; D, gingival margin of band showing as shoulder on die to be guide in waxing crown; this makes it possible to reproduce the gingival fit of the impression band in the finished restoration.

are finished, this area will be constant, and all that is needed is one molar on each side to give balance in the guide.

2. If a condition should arise in which all teeth on one or both sides of the arch are restored with crowns or inlays, the removal of which in the preparation would make the occlusal surfaces lower on the master cast, provision must be made to establish the relationship in the occlusal positioning guide. This is done by placing base-plate wax in the guide to make contact with the most posterior tooth which has been lowered.

3. The wax is covered with 40gauge tinfoil; the guide is placed in the mouth, and the patient is told to bite. The anterior inclined planes of the guide will direct the mandible to

the correct position.

If the procedure just described is required, it is followed when the master impression is obtained, because at that time, all cavities in one arch are open. Naturally, the procedure could not be carried out if the temporary inlay or crowns were in place. When it is anticipated that the guide will have to be placed in the mouth to secure a relationship, it is best to construct the guide of metal. Wax can be used for other cases.

THE METHOD OF CONSTRUCTING Positioning Guide With Metal or Wax (Fig. 3)

1. Tinfoil (60-gauge) is burnished over the occlusal and incisal tips of the teeth on each cast, care being taken not to contact areas representing soft tissue (Fig. 3, B). The tinfoil is extended across the palatal and lingual areas to help direct the metal in the pouring operation. A drop of sticky wax placed at advantageous points on the buccal and labial surfaces will hold the tinfoil in position when the articulator is closed to centric relation.

2. A rope of slightly moist cotton is laid around the buccal and labial surfaces of the casts and held tightly in place with a wire loop (Fig. 3, E). This is to seal the outer opening between the two pieces of tinfoil, so that the low-fusing alloy can be poured from the palatal area between the pieces.

3. With a hot spatula, metal can be added or removed in finishing the buccal and the labial surfaces (Fig.

4. With sharp curved scissors, the metal is trimmed neatly to finish, and the guide is put aside until the master casts are ready for mounting.

Construction of Positioning Guide with Base-Plate Wax (Fig. 4)-1. Sheets of base-plate wax are placed together by heating to fill the opening between the casts.

2. The wax is covered with 60gauge tinfoil and trimmed to fit the arches.

3. The wax is softened in warm water, placed in position on the casts, and the instrument is closed without forcing to centric relation. When the centric position has been reached the

operation is complete.

Study of Casts for Cavity Preparation-1. One of the important considerations when outlining the preparation is to lay margins on areas that will insure harmonious lines in the

finished contours.

2. Because the band impressions that are to be taken must be exact reproductions of all marginal areas, the correct extension of proximal walls is necessary to permit a soft copper band to make a close contact with gingival and proximal cavosurfaces, and thus prevent the impression compound from flowing into under-

3. Steps and seats can be made shallow when angles are cut sharp, particularly when a large area is to be covered by the inlay. The shallow preparation is well adapted to an in-

direct technique.

4. As designs are determined, they are outlined on the cast with a soft lead pencil or gold paint. The internal outlines of cavities are drawn with a pen on the roentgenograms by indicating the depth of steps and

5. All preparations in one arch should be completed and the master model made and mounted before work on the opposite arch is begun.

6. As the preparations are finished the dentine should be phenolized and varnished before impressions are taken.

THE TECHNIQUE OF CONSTRUC-TION AND THE USE OF TEMPORARY INLAYS AND CROWNS

Temporary inlays and crowns are a necessary precaution when so many teeth are open, awaiting restoration; moreover, the patient is made more comfortable and can masticate efficiently. When alloy models are used, restorations are poured of metal having a fusing range of 60 to 64° C.

Group Impression-1. An impression is taken of all cavities at once, with compound in a crown and bridge tray (Fig. 5).

2. This is chilled well before

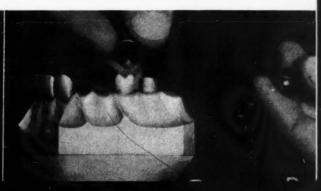
removal.

3. A cast is made with quick-

Fig. 11—Impression for three-quarter crown. A, Metal model representing patient, B, 32-gauge soft copper band correctly fitted; C, compound placed in band ready to force to place; D, finished impression.







setting plaster, which should be filled without air pockets. By the time the operator has completed the band impression for the amalgam dies, the plaster cast will be ready.

4. The interproximal area is walled off with a damp napkin and pouring is done at once with the low-fusing alloy, which is removed and finished in one piece.

A group of teeth may be sealed conveniently in the manner described.

5. For a single tooth, take a piece of compound in the fingers; secure the impression and make a plaster cast; wrap a strip of paper around the tooth to form a matrix, and pour the low-fusing alloy. Casting is done by placing a finger over the metal to press it to place (Fig. 6).

Crown Construction for Immediate Use—1. An impression is taken with compound in a tray, and poured

with plaster.

2. The tooth to be crowned is sectioned out of the cast with a saw. The gum-line forms the shoulder to create a space between the side walls of the tooth and the paper matrix.

4. Low-fusing alloy is poured; casting is done with finger pressure, and finishing, with a hot spatula, carborundum discs, and vulcanite

burs.

Second Method of Construction—Another method of constructing a temporary case is to await construction of copper amalgam dies (Figs. 7 and 8). Paper is wrapped around the die to form a matrix; low-fusing alloy is poured, and a finger is placed immediately over the metal to be cast. Remove and finish. Should a contact be lose, metal is added with a hot spatula to tighten. The case should

be removed from the die, when finishing with burs and discs, to prevent scarifying the die.

In making low-fusing alloy crowns, inlays or three-quarter crowns, burnish 60-gauge tinfoil over the die and trim to the margin; pick up the alloy with a concave spatula, and spread to correct thickness.

Setting Temporary Restorations— Temporary inlays can be set with any good temporary cement, which would not make removal too difficult. Thick chloro-percha is, to my mind, the material of choice, as it not only seals and holds well and permits the easy removal of inlays, but also has the added quality of being easy to remove from the cavity. Pink guttapercha is used because it is readily distinguished from dentine.

The cavity is cleaned thoroughly and wiped with eugenol; the inlay is spread with chloro-percha and forced to place. The surplus is wiped off with a cotton roll, and the operation

is completed.

Impressions for Inlays (Fig. 9)-

1. A soft copper band is fitted tightly, extending slightly beyond the gingival bevel and down to the height of contour on sound areas. The band is now annealed to make it entirely soft.

2. With the band in position, just enough compound to fill it is heated to working consistency throughout the apex, glazed, and forced to place.

3. The compound is then chilled with cold water.

Impressions for Full Crowns (Fig. 10)—1. For the full crown a soft 32-gauge copper band is fitted tightly and festooned to the gingival position that the finished crown is to occupy.

2. As the band is to be the gingival half of the impression, care must be taken to fit this area accurately.

 After completing the fitting the band is removed, annealed, and replaced.

4. The upper part of the impression is completed with compound.

5. When the die is made, the gingival margin of the band will show as a shoulder. This will be the guide in reproducing the gingival festooning of the impression band in the finished crown.

Impressions for Three-Quarter Crowns (Fig. 11)—In securing an impression for a three-quarter crown, the band is filled with compound and forced to place, instead of being placed on the tooth and the attempt made to force compound to place. This is done because the band is in such close proximity to the side walls of the preparation that the compound cannot flow to place. If the band is fitted carefully to cover all margins and the labial area is cut so as not to cover undercuts, excellent impressions can be secured.

1. A 32-gauge soft copper band is trimmed to cover margins and cut out on the labial aspect in such a way as not to cover undercuts.

2. The band is filled with compound; forced to place, and chilled.

3. With a sharp knife, the excess compound is trimmed to margins of the band before removal from the tooth.

4. In case a perfect impression is not secured, it is best to remove the compound and start over as attempts at correction seldom yield good results.

(End of First Installment)

1124 Republic Building.

ABOUT OUR CONTRIBUTORS

JOHN PETER CARMICHAEL, D.D.S. was graduated from the University of Michigan College of Dentistry in 1880. Doctor Carmichael has contributed many articles to dental publications on the subjects of pyorrhea, dental prophylaxis, tooth enamel, and root canal therapy. As early as 1885 Doctor Carmichael wrote an article on COCAINE AND ITS APPLICATION TO DENTISTRY. He is a member of the American Dental Association and the American Professional Institute, and has a general practice.

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AMOS GEORGE STIKER, D.D.S. (University of Buffalo School of Dentistry)

is a member of the American Dental Association and component societies. Doctor Stiker contributed the material for a pictorial presentation on IMMEDIATE DENTURES FOR THE AVERAGE DENTIST in the December, 1934 issue of the DIGEST. His present article is another example of visual story-telling.

WESTON A. PRICE, D.D.S., M.S. needs no introduction to readers of the dental literature, certainly not to those who have read THE DENTAL DIGEST since March, 1933, when his series on WHY DENTAL CARIES WITH MODERN CIVILIZATIONS was begun. The first installment of the studies concluded in this issue appeared last month.

The Editors Page

LEXIS Carrel has reached back into his experiences to create a profound MAN, THE UNKNOWN.1 book, Doctor Carrel has drawn his material on subjects outside his own specialty from his associations with other eminent scientists at the Rockefeller Institute of Medical Research. This book represents a synthesis of this heterogeneous and component material. It is a story of man's mind and body; the picture of man in the future, both as an individual and as a part of the race. The comprehensive approach to "man, the unknown" is suggested in this well-phrased

paragraph:

Man, as known to the specialists, is far from being the concrete man, the real man. He is nothing but a schema, consisting of other schemata built up by the techniques of each science. He is, at the same time, the corpse dissected by the anatomists, the consciousness observed by the psychologists and the great teachers of the spiritual life, and the personality which introspection shows to everyone as lying in the depth of himself. His is the chemical substances constituting the tissues and humors of the body. He is the amazing community of cells and nutrient fluids whose organic laws are studied by the physiologists. He is the compound of tissues and consciousness that hygienists and educators endeavor to lead to its optimum development while it extends into time. He is the homo oeconomicus who must ceaselessly consume manufactured products in order that the machines, of which he is made a slave, may be kept at work. But he is also the poet, the hero, and the saint. He is not only the prodigiously complex being analyzed by our scientific techniques, but also the tendencies, the conjectures, the aspirations of humanity.

The human body and its maladjustments and its disease processes are our professional concern. Man in his other aspects is our concern as men in the social group. We must live with him, work with him, attempt to understand him. With the years of close scrutiny of biologic processes Carrel has not developed the contempt often associated with familiarity. He has instead developed a profound respect and an intellectual skepticism as he watched the complex powers of the human body and mind reveal themselves to his observing eye. He has grown to see that: "... the human body is placed on the scale of magnitudes, halfway be-

tween the atom and the star Slowly we dentists are evolving from the purely mechanistic concept of our specialty. Carrel's book should help us along this road. From it we may learn more of the romance and the drama of the individual cell. From the union of two single unlike cells there has Harper & Brothers, 1935.

been created this complicated structure of anatomic heterogeneity with its millions of cells that we call the human body. This body with its structurally unlike organs and tissues functions in health with every part synchronized in physiologic homogeneity. Disturbance of a part, any part, destroys the rhythm and the function of the whole. That disturbance may express itself as dental caries; in turn, this local expression of disease may set in motion discords in other and distant parts. Thus dental caries is part of a total biologic mechanism, and we as dentists are concerned with total personalities rather than with anatomic

Although Carrel says nothing specifically about dental caries, his comprehensive explanations of life processes will help us to a better understanding of the nature and the function of the tissues with which we deal. In the true communal life of cells, it appears that the "individual cells . . . act in the interest of the whole" as the bee acts in the communal interest of the hive. What power or force guides these behaviors of the cell or of the bee is part of the pattern of the Universe. Observations and experience give validity to our belief in a purposeful plan: the behavior of bacteria, the defense reaction of a tissue cell, the falling cometthese give testimony.

To treat disease we must be philosophers as well as dentists or physicians. Disease, and that includes the decay of a tooth, is a complex process, as those who have probed its etiology have found. It is a part of a total anatomic and physiologic whole. The body that shelters the disease process has tendencies inherited from peoples out of the past. The outer world presses in upon this body from every side to influence and mold its behavior in health or disease.

Man is literally made from the dust of the earth. For this reason his physiologic and mental activities are profoundly influenced by the geologic constitution of the country where he lives, by the nature of the animals and plants on which he generally feeds. . . . He is a nutritive process. He consists of a ceaseless motion of chemi-

cal substances.

The motives and the conflicts of the world break through man's anatomic defense to assail his nervous system. From this assault disease may also come. Every day we deal with Man, the Unknown; we should, at least, try to know him better.

SIMPLIFIED IMMEDIATE DENTURE IMPRESSIONS

AMOS G. STIKER, D.D.S. Addison, New York

UR objective is an impression that is almost muscle-trimmed and gives excellent soft tissue detail, especially at the periphery.

At the edges the impression must be almost as thin as the denture is to be. The impression must not lift the cheeks away from the position they are to

occupy when the finished denture is inserted. We should approach the plan of the closed mouth impression. Tissue compression is not sought.



Fig. 1—A preliminary impression is taken in counter wax which is the soft wax used at dental depot tooth counters for trying porcelains on models. The impression is removed from the mouth without waiting for it to hadden



Fig. 2—At least one-fourth inch is cut away from the palatal relief area. The buccal and labial periphery is relieved slightly if at all. A great deal is cut away at the sides of the tooth areas. Little or none is taken from the occlusal surface imprints. The imprints of the occlusal surfaces of at least two teeth are left intact. These will act as stops and keep the tray from going up too



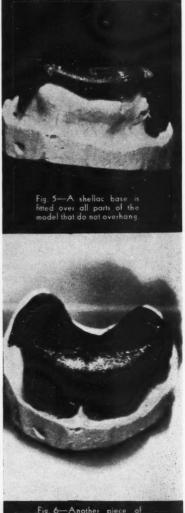




Fig. 7—A number 8 bur is used to make holes through which the impression material will stick.



Fig. 8—The front of an old tray, when melted into the shellar, joins the parts together. Sticky wax may be used sparingly to insure adherence. Note that the tray handle fits so closely as to permit the patient almost to close his jaw.

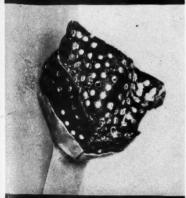


Fig. 9—The tray handle will not unduly lift away the lips.



Fig. 10—The tray should fit as shown in the drawing. The molar stops the tray from going up too far. There is room where needed but there is no excess material to distort the muscles.



Fig. 11—The impression is easily taken with a hydrocolloid impression material. The mouth being nearly closed, the patient's tongue is automatically placed against the post-dam area and the soft palate is automatically lifted. The impression material does not cause gagging. It might, however, if the mouth were wide open. The muscles are as near to their normal positions as any impression can leave them. The corners of the mouth are now pulled forward by the dentist. (In order to show the thumb and finger, the hands were photographed in an unnatural position.)



Fig. 12—The impression fulfills the required specifications. The periphery is of the correct thickness although the thickness varies from place to place.



Fig. 13—A lance readily



Fig. 14—A Kingsley scraper is used for the post-dam



Fig. 15—A baseplate material trial plate may be adapted to the model and tried in the mouth. This and a mouth mirror often reveal errors in the post-dam. An elaborate trial plate may be made of transparent collulaid.



WHY DENTAL CARIES WITH MODERN CIVILIZATIONS?

14. Field Studies in Kenya, Uganda, Belgian Congo, Sudan, and Egypt

(Continued)

WESTON A. PRICE, D.D.S., M.S.

Cleveland

THE Masai live in an extensive game preserve in which hundreds of thousands of grazing animals enjoy a protected existence from man because even the natives are no longer allowed to kill the animals. These animals seemed to be preserved for the numerous lions. Sometimes these lions become bold, inasmuch as they have an abundance of food and no enemies unless they attack the herds of the Masai. Recently the local government authorities, as reported, found it necessary to shoot eighty of the lions in a particular district because of their aggressive-

There are several tribes that depend largely on cattle products for their food. In every case they are tall, athletic, and courageous people who dominate the surrounding tribes. Whereas the Masai use a breed of native cattle with a hump on their shoulders, the Anchola herdsmen of Uganda use a long-horned variety which can better protect themselves and their young from predatory animals. The size of the horns of this stock are phenomenally large, as illustrated in Fig. 6.

There is an interesting tribe, the Watusi, living on the east of Lake Kivu, one of the headwaters of the West Nile in Ruanda which is a Belgian Protectorate. They are tall and athletic. They have different countenances from the other tribes and boast a noble inheritance. According to their legend, a Roman military expedition penetrated into central Africa at the time of Anthony and Cleopatra. A phalanx remained, refusing to return with the expedition. They took wives from native tribes and passed laws that thereafter no marriage could take place outside their group. They have magnificent physiques (Fig. 7).

Several of the tribes neighboring Ethiopia are agricultural, and grow corn, beans, millet, sweet potatoes, and bananas as their chief articles of food. These tribes are not physically so well built as those using dairy products liberally or those using fish from the fresh water lakes and streams. These tribes have been dominated because of their having less courage and less resourcefulness.

The government of Kenya has for several years sponsored an athletic contest among the various tribes, the test being one of strength in a tugof-war. One particular tribe has carried off the trophy repeatedly. These tribesmen reside on the east coast of Lake Victoria and live largely on fish which are dried and carried far inland. They are powerful athletes and excellent swimmers. They are said not to have been conquered in warfare when they could take the warfare to the water. One of their methods is to swim under water to the enemy's fleet and scuttle their boats without being discovered. They fight with spears under water with extraordinary skill. Stanley was locally reported to have had an experience with them. He unwisely joined his forces with an enemy tribe and undertook to subdue these people with the result that he was defeated. It was of particular interest to study these people and note their magnificent physiques. In a group of 190 boys who had been gathered into a mission school near the east coast of Lake Victoria, only one boy was found with dental caries; two teeth were carious.

Uganda which lies to the north

and west of Lake Victoria and west of Kenya is high, and although it is on the equator, it has an equitable climate with an abundance of native foods. They grow two crops per year and many varieties of bananas grow wild. In many respects this district is like Ethiopia.

As one travels down the West Nile and later along the western border of Ethiopia, many unique tribes are met. A typical negroid type of the upper Nile region is shown in Fig. 8. Many of these tribes wear little or no clothing. They have splendid physiques and a high immunity to dental caries.

Owing to the confluence of the White Nile and West Nile, the former draining Lake Victoria and the Uganda lakes through Uganda, and the latter draining Lakes Kivu, Edwards and Albert, and eastern Belgian Congo, the volume of water moving northward is large. A unique obstruction to navigation has developed by the Nile going underground for a considerable distance. In this district vegetation is rank and prolific, including large quantities of water plants. These plants form islands which often attach themselves temporarily to the shore. The water carries quantities of alluvia which furnish an abundance of nutriment to the floating plant life. Accordingly. many of these floating islands of plants have a large quantity of soil enmeshed in their roots. At some period in the past the river became bridged across in upper Sudan near its southern border. With the progressive addition of new material, a large natural bridge has been raised on which large trees are now growing and across which are elephant trails. This and a series of rapids necessitate a detour of more than a hundred

The elephants were so numerous in this district that both in Uganda and Sudan the government was required to send in special hunters to reduce the herds. In one district in Uganda two hundred were said to have been slaughtered. They are destructive to banana plantations. They break the banana trees over or pull them up by

Fig. 6—In the leopard infested districts cattle with enormous horns have been developed.

Fig. 7—A man of the Watusi tribe living east of Lake Kivu. They claim to be descendants of a Roman phalanx. This man is more than 6 feet tall.

Fig. 8—A typical West Nile mother and child.

Fig. 9—This pigmy woman is the mother of five grown men.

Fig. 10—A typical scene in the pigmy forest. They are receiving the cherished salt. Note the size of the pigmies as compared with the medium-sized white man in the picture.

Fig. 11—This elderly Neur man is about 7½ feet in height, nearly twice that of the pygmy woman shown in Fig. 9. Both have excellent physiques.

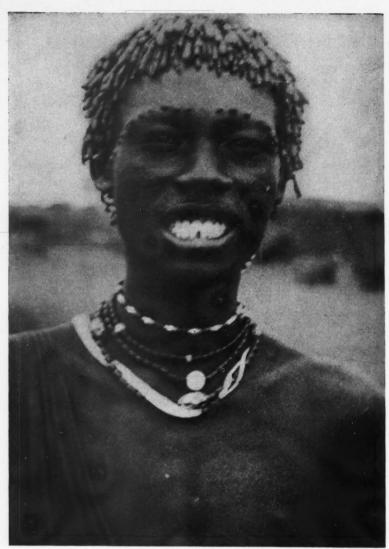


Fig. 12—A typical Dinka of central Sudan.

the roots and eat the succulent heart as well as the fruits. In a night a herd may destroy an entire plantation of bananas. The only people in these districts permitted to kill the elephants without license are the pygmies. They are also the only ones not required to pay a head tax. There are many tribes of them in the great forest area in the Belgian Congo and Uganda. Their skill is remarkable. They are able to kill elephants with their spears without the elephant knowing what is happening. It takes them one and two days to hamstring the elephant by working stealthily from behind, always keeping out of the elephant's sight. Although an elephant can scent a human being for a long distance, these pygmies can disguise themselves so completely that the elephant is unaware of their presence. After disabling the elephant by

cutting the tendons of both hind legs, the pygmies let him see them and while one of the pygmies attracts his attention the other hacks off his trunk. In this manner he bleeds to death. They are particularly fond of elephant meat and a slaughter means a great feast. While we were in one of the pygmy colonies, the tusks of an elephant, which two of the natives had just killed, were brought in. We had the rare opportunity of witnessing the celebration in the colony which included a special reenactment in pantomime of the attack and method of killing the elephant. The pygmy mother of these two men is shown in Fig. 9. She has three other grown sons. It will be noticed that she is a full head shorter than Mrs. Price who is 5 feet 3 inches in her walking shoes. These pygmies are skillful marksmen and trappers.

Their arrows are tipped with iron of their own manufacture and have receptacles for carrying drugs which they extract from plants and which temporarily paralyze the animals. For animals that they wish to destroy, the arrows carry a poison that rapidly produces death. The home life of the pygmies in the forest is often filled with danger. Just before our arrival at this pygmy tribe, two babies had been carried off by a leopard. This stealthy night prowler is one of the most difficult animals for them to combat and is one of the reasons that the pygmies sometimes build cabins in the trees. Ordinarily their homes are built on the ground in a little clearing in the forest. They consist of low shelters covered with banana leaves and other plants built over a framework, such as shown in Fig. 10. In this view a native missionary is seen dispensing the salt to the pygmies. This is one of their most prized

Anglo-Egyptian Sudan has an area approximately one-third that of the United States. It is traversed throughout its length from south to north by the Nile. There are several interesting tribes living along this great waterway who are of special interest now owing to their close proximity to Ethiopia. They are hunters and warriors who use long-bladed spears. The shores of the Nile for nearly a thousand miles in this district are lined with papyrus and other water plants to a depth of from several hundred yards to a few miles. Back of this area the land rises and provides fine pasturage for the grazing cattle. These tribes use milk, blood, and meat from the cattle and large quantities of animal life from the Nile River. Some of these tribes are tall, particularly the Neurs, one of whom is shown in Fig. 11, again shown with Mrs. Price for comparison of height. The women are often 6 feet or taller and the men 7 feet, and some of them are 71/2 feet tall. I was particularly interested in their food habits, both because of their high immunity to dental caries which was almost one hundred per cent and because of their physical development. I learned that they have a belief which to them is their religion; namely, that every man and woman has a soul that resides in the liver and that a man's character and physical growth will depend on how well he feeds that soul by eating the livers of animals. The liver is so sacred that it may not be touched by human hands. It is accordingly always handled with their spear or saber or specially prepared forked sticks. This sacred food

is eaten both raw and cooked.

Many of these tribes, like the Neurs, wear no clothing and decorate their bodies with designs, some of them representing strings of beads produced by putting foreign sub-stances under the skin in definite order (Fig. 12). The Dinkas are brave and skillful warriors. They, like the Shilluks and Neurs, raise cattle. In addition to dairy products, they use large quantities of animal life from the Nile River. They have maintained a particularly bitter warfare against the Arab slave dealers who have come across from the Red Sea coast to carry away the women and children. In isolated districts they are still suspicious of foreigners in their midst. We were advised that in one district adjoining Ethiopia all light-skinned people are in danger and cannot safely enter that territory without a military escort. This tribe has a unique way of carrying special food for emergency expeditions. The food is rolled into the hair as shown in Fig. 12. This leaves the hands and rest of the body free. The food is kept out of the water when wading and swimming. The excellence of the teeth is shown; also the effect of removing some of the lower front teeth to provide a means of feeding in case of lockiaw.

This problem of protecting the members of the tribes from being carried away for slaves has developed some unique methods for guarding the women. One of these is shown in Fig. 13. In this Bamberi tribe of northeastern Belgian Congo, method was adopted of piercing the upper lip, when the woman was young, and inserting successively larger pieces of wood which were allowed to swell from the moisture. In this way the hole was progressively stretched, so that it was often as large as the person's arm. When eating, the lip is held up with one hand to permit the food to be passed to the mouth. This greatly interferes with speech but is said to have proved effective in protecting the women from being kidnaped. Fortunately, this practice is dying out among the younger generation, with the rigid prohibition of slavery.

While slavery of the old form no longer exists in the so-called civilized countries, in a new form it is a tragic reality for many of the people. Taxes and new demands are required by the new order of living. For many of these primitive tribes a new suit of clothes could formerly be had every day with no more trouble than cutting a new banana leaf. With the new order they are requested to cover

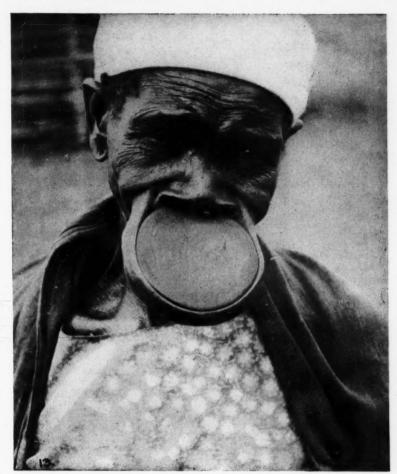


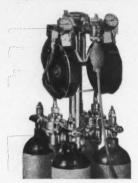
Fig. 13—A woman of the Bamberi tribe in Belgian Congo. They were said to have disfigured themselves in this way to prevent being carried into slavery.

their bodies with clothing. Cloth of all kinds, including the poorest cotton, has to be imported. They must pay an excessive charge owing to the long transportation cost of the imported goods which often exceeds the original cost in the European or American markets several-fold. In order to pay their head tax, they are often required to carry such products as can be used by the government officials, chiefly foods, over long distances for a part of each year. These often include the very foods that the adults and particularly the growing children need to provide body growth and repair. This naturally has produced a current of acute unrest and a chafing under the foreign domination.

As we circled Ethiopia we found the natives not only aware of what was going on in that border country but deeply concerned regarding the outcome. From their temper and sympathetic attitude for the oppressed Ethiopians, it would not be surprising if sympathizers pass over the border into that country to support their crushed neighbors. The problem is accordingly very much larger than the interest of some particular foreign power. It deals directly with the future course of events and the attitude of the African natives in general toward foreign domination. The native African is not only chafing under the taxation of foreign overlords but is conscious that his race becomes blighted when met by our modern civilization. I found them well aware of the fact that those of their tribes who adopted European methods of living and foods, not only developed rampant tooth decay but other degenerative processes.

In one of the most efficiently organized mission schools that we found in Africa, the principal told me that they had a serious problem and they wished me to assist them in answering it. For a study of this problem, he asked me to confer with a native member of his staff of

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McKesson Appliance Company Toledo Ohio teachers who outlined it as follows: He said there was no single question asked them so often by the native boys in their school as why it is that those families that have grown up in the mission or government schools were physically not so strong as those families who had never been in contact with the mission or government schools. These young men were thinking. I was even asked several times whether or not I thought that the native Africans must go the way of the Red Indians of America.

The happiness of these people in their homes and community life is everywhere striking. A mining prospector who had spent two decades studying the mineral deposits of Uganda was quoted to me as stating that if he could have the heaven of his choice in which to spend all eternity it would be to live in Uganda as the natives of Uganda had lived before modern civilization came to it.

While intertribal warfare has largely ceased, a new scourge is upon them; namely, the scourge which comes with modern civilization.

I am not able in this communication to present any information relative to the physical evidence of bodily degeneration among primitive races in contact with modern civilization. This degeneration is strikingly demonstrated in the change in facial form and by the development of irregular dental arches in those members of these tribes who have adopted the less efficient food programs being taught by the Europeans and other foreigners. I have presented preliminary data on this in my recent paper before the American Dental Association meeting in New Orleans. When the analysis of the foods is completed the data will be reported.

In the primitive racial stocks previously studied and reported, we found that modernizing forces were often associated with a marked increase of the death rate over the birth rate. The population of the Eskimos in Alaska is probably reduced to less than one-fifth the number that lived there a hundred years ago. Similarly in many of the islands of the South Seas we found the populations to be often not more than one-fourth what they were a hundred years ago. In the Marquesas Islands the local Commissioner told me that there are now less than two thousand natives left. Their population was estimated to have been as high as one hundred and fifty thousand a century or more ago. In Tahiti a population of two hundred thousand had been reduced to less than Pyorrhea Surgery for the General Practitioner

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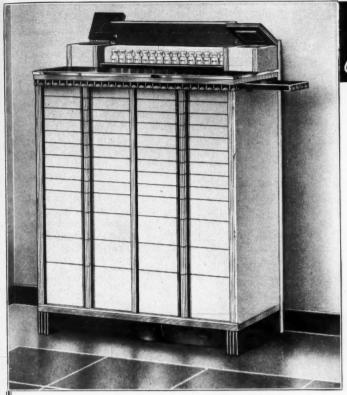
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eight thousand. Similarly in some districts in Africa a marked degeneration is taking place. Geoffrey Gorer¹ in his book written after studies in West Africa discusses this problem at length. He quotes figures given by Marcel Sauvage² in his article on French Equatorial Africa: "In 1911 French Equatorial Africa had twenty million Negro inhabitants; in 1921 there were seven and a half million; in 1931 there were two and a half million." He states regarding the quotation: "These figures were given in a responsible French conservative paper and have not been denied." Major Browne,³ a high official of the British Government Administrative Department of Kenya, with long experience, states in the closing paragraph of his book:

It must also be remembered that the blessings of civilization" are not in practice by any means as obvious as some simple-minded folk would like to believe. It can be said with fair accuracy that among the tribes with which we have been dealing there is, in their uncontaminated society, no pauperism, no paid prostitution, very little serious drunkenness, and on the whole astonishingly little crime; while practically everyone has enough to eat, clothing, and an adequate dwelling, according to the primitive native standard. Of what civilized community can as much be said?

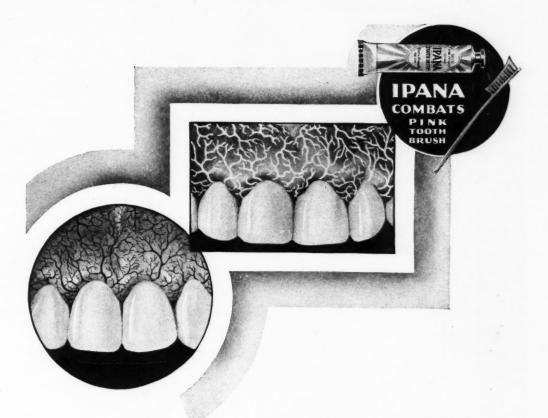
Civilizations have been rising and falling not only through all the period of recorded history but long before as evidenced by archeological discoveries. If we think of Nature's calendar as one in which centuries are days and civilizations are years, the part current events are playing in the history of a great continent like Africa may be mere incidents.

This much we do know that throughout the world some remnants of several primitive racial stocks have persisted to this day even in very exacting environments and only in these environments could they have been protected. The primitive Eskimos of Alaska belong to the Stone Age and we are seeing in them people as of ten thousand years ago. They have persisted despite their extremely severe environment.

In my studies of these several racial stocks I find that it is not accident but accumulated wisdom regarding foods that lies behind their physical excellence, and freedom from our modern degenerative processes; further, that on various sides of our world the primitive people know many of the same things that are essential for life-things that our ¹Gorer, Geoffrey: African Dances, Faber and Faber.

²Sauvage, Marcel: Les Secrets de l'Afrique oire, Intrasigeant, from July 28 to August Noire, Intrasigeant, 170111 17. 1934. Browne: The Vanishing Tribes of Kenya.

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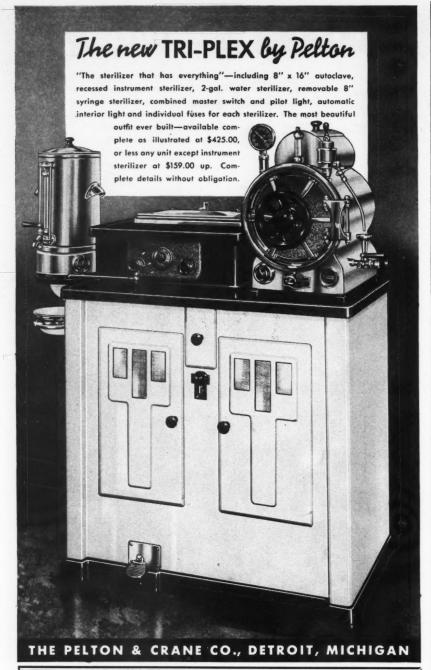
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modern civilizations apparently do not know. These are the fundamental truths of life that have put them in harmony with Nature through obeying Her nutritional laws. Whence this wisdom? Was there in the distant past a world civilization that was better attuned than we are to Nature's laws and have these remnants retained that knowledge? If this is not the explanation, it must be that these various primitive racial stocks have been able through a superior skill in interpreting cause and effect to determine for themselves what foods are best in their environment in order to produce human bodies with a maximum of physical fitness and resistance to degeneration. Clearly, these remnants of primitive civilizations can teach us a great deal.

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LETTERS TO THE EDITOR

REMOVING TEETH FROM DENTURES*

After many years of struggling with what has been the standard method of removing teeth from dentures, I tried a new method when removing teeth from a phenol formaldehyde thermoset. The usual method seems to be to apply wax to the teeth and heat in the flame before the tooth is pried off; often, some vulcanite is pried off with the tooth, which may burn the fingers.

The method suggested here is to boil the denture in water and pry the teeth off while holding the denture in the boiling water with a pair of pliers. A wax spatula or other suitable instrument is used for this purpose. If the case is thoroughly warm, the teeth, if pried carefully, can be removed without material adhering, unless the case is thin at the site of the tooth. This suggestion applies only when all teeth are to be removed.

-J. C. GORDON, D.D.S., St. Louis.

*EDITOR'S NOTE: The synthetic plastics used for dentures may be classified as thermosets and thermoplastics. The phenol formaldehyde resins are compounds of phenol and acetic acid, and are thermosets. Vinyl resins are composed of acetylene and acetic acid (thermoplastic). The glyptal resins are compounded from glycerol and phthalic acid (thermoplastic). Styrol resins are also thermoplastic.

The thermosets undergo a chemical change on heating, but the material will not soften again when reheated. These bases are baked onto, and not pressed around the pins of the teeth.

The thermoplastics are softened by heat and then formed in the mold under pressure. Hardening of the thermoplastic is done by cooling. No chemical reaction takes place when molding. The celluloids are thermoplastic, but a chemical change occurs in heating which makes the finished base porous and unstable. If the



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These were the simple words used by Anton Van Luewenhoeck in his letter to the Royal Society of London in 1683, in which the Dutch Microscopist so graphically described his famous discovery of Bacteria through his observations upon tartar scraped from the teeth.

It was not until two centuries later, however, that Professor W. D. Miller first associated mouth bacteria with tooth decay. Shortly after Professor Miller completed his investigations, Dr. N. S. Jenkins, a noted American dentist practising in Europe, began his study to develop an agent that would not only cleanse the teeth but destroy the bacteria that inhabited the mouth. Working in cooperation with Professor Miller, Dr. Jenkins continued his study and experiments until 1908 when the success of his efforts was confirmed by leading medical and dental scientists in the United States and Europe.

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thermoplastics are not free flowing at pressing temperature, they tend to revert to the original form after pressing. This is known as elastic recovery and was apparent in the celluloid bases but not in the vinyl thermoplastics in the tests reported in Australia.

—Adapted from an article by Meldrum, Frank: The New Plastic Denture Base Material, Australian J. Dent. 39:369 (November 1) 1935.

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There is a simple and inexpensive method to bring order to the collection of copies of The Dental Digest saved for future use. At the dime store a neat, black, flexible, loose leaf folder, about 9½ by 11½ inches in size may be purchased for twenty cents. A leather punch that will make a round hole five sixteenths of an inch in diameter may be found at any hardware store.

A pattern is made of a fairly stiff piece of paper 8½ by 11 inches for the correct position of the holes which are made with the punch. Cut from each issue the articles that you wish to save; then use the pattern as a guide to punch the holes and trim the pages to the proper size for the folder. Loose leaf reinforcements should be used over each hole on each page. The pages of the articles can then be arranged in the folder as desired.

This method of binding articles from THE DIGEST will permit arrangement by subjects; that is, all articles on the subject of dentures, crown and bridge, and so on, may be kept together and over a period of years could be grouped thus in separate binders.

thus in separate binders.

This binder may also be adapted to preserve and display the Patient Education Charts.

-EARL MCNOTT, D.M.D., Multnomah, Oregon.

"THE KEYS TO SAN FRANCISCO!"

"Dear Harry:

"Was certainly glad to hear from you. And you can bet a hat that I'll be on hand at the Ferry Building to meet you, Elsie, and the boys when you arrive in San Francisco in June. In the meantime, I'll see if Mayor Angelo Rossi has an extra key to the city!

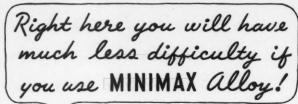
"Anyway, we do want you to enjoy San Francisco this year. The Convention is bound to be good on its professional side—technique, inspiration, and all that—but its background and attendant activities will make it unique. I don't have to be a seer to look into the future and see thousands of dentists and their families taking to San Francisco with an enthusiasm that won't be quelled.

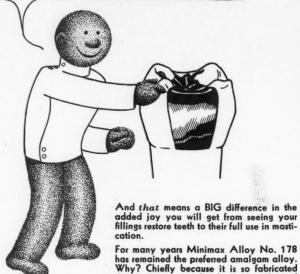
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THE DENTAL DIGEST 1005 Liberty Ave. Pittsburgh, Pa.

Valley over the Fourth of July. We'll drive there by way of Monterey, a delightful town located on the curving bay of Monterey, and close to Carmel and its white beach. Spanish dons and senoritas lived regally there a century ago, and today there are dozens of landmarks that recall those idyllic days-delightful old abodes, historic buildings, and two old Mis-

"I hope you won't forget to bring along your golf clubs. The Pebble Beach course, on Monterey's Peninsula, is one of the world's finest; a champions' course, in fact, with one

or two hazards of surf.

"By the way, the last time we played golf you gave me some lessons in the fine art of putting. Well, I want to take you to Lincoln Park, right here in San Francisco, only twenty minutes' drive from my office, and try to show you a thing or two. This golf course is built on a bluff overlooking the Golden Gate strait. The blue waters of the channel, the sun's afternoon rays glinting on a passing liner, the high, dark towers, and graceful cables of the world's longest suspension bridge, are just a few of the mental hazards. I'm relying upon them to divert your attention sufficiently to let me win a

"If you can still ride a horse as well as you did up at the Lake, I'm going to take you riding over the bridle paths in Golden Gate Park. Bruno Lessing, the columnist, re-cently stated that San Francisco's bridle paths were beyond 'compare, and he should know, for he's traveled.

"Some of the trails in the park parallel the smooth motor roads, but others branch off and penetrate stately forests of pine, cypress, eucalyptus, and other trees. And here is sylvan beauty for you, Harry, trees forming a bower over a shady path, with the way leading now and then past some picturesque little lake that reflects rhododendrons and hydran-

"Another time, we'll take Elsie and the boys, drive out to the Park and then do a little walking. First, we'll visit the Japanese Tea Garden, the gift of an emperor. Beneath the dwarfed cypresses, the cherry trees, and the wisteria vines, we'll have tea and rice cakes, served by Japanese maidens in old-world flowery costumes. Then we'll walk about the garden, which is thoroughly reminiscent of old Japan, with its miniature lakes and waterfalls, arched bridges and stepping stones, Buddha lanterns and bronze cranes, and goldfish in the quiet pools into which little streams of water flow with murmured song.



FINAL FITTING SIMPLIFIED

Regardless of how perfect the original impression, how exact the wax pattern, how faithful the denture reproduction, some final finishing work is usually required in fitting the denture. With Luxene resinoid dentures finishing is easily and quickly accomplished with the dentist's regular equipment.

Luxene resinoid is a hard and tough material, and its homogeneous nature is such that it can be ground down or filed without the slightest chance of chipping or roughening. The nonporous density of the material is more than a surface characteristic, it is inherent. Grinding away the surface does not in any way diminish the non-absorbent properties of Luxene resinoid. Buffing will quickly restore a brilliant lustre to any ground edge or surface.

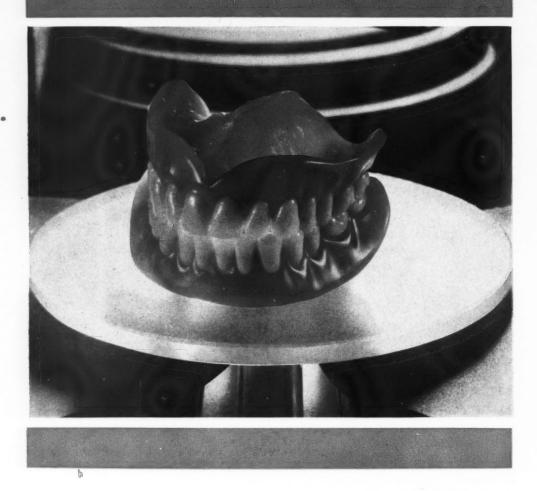
Dentists will find that Luxene resinoid possesses all of the advantages of long established denture materials plus others which they have greatly desired but have never been able to obtain. These advantages are summarized on the back of this insert.

To learn the history of Luxene resinoid and the reasons for its remarkable success, write for a copy of our illustrated booklet P.

BAKELITE DENTAL PRODUCTS, Inc.
SUBSIDIARY BAKELITE CORPORATION

247 Park Avenue, New York, N. Y.





ORIGIN AND DEVELOPMENT OF LUXENE RESINOID

The discovery of phenol-formaldehyde resinoid by Dr. L. H. Baekeland twenty-eight years ago, opened up many avenues for creative laboratory research. This new resinoid, which was named Bakelite, became the base for several thousand new materials. It soon was evident that Bakelite resinoid possessed many properties long

sought for in a denture material, but it required some twenty years of intensive laboratory research and continuous experiment to produce a denture material which was superior in all essentials.

This objective was attained in 1932, and the new resinoid material was called LUXENE.

Properties and Advantages of Luxene Resinoid

- 1. Natural Color. Its translucent pink is durable and closely simulates color and appearance of healthy gums.
- 2. Strength. It is tough, strong and resilient. A check of 35 thousand dentures showed only 1.7% breakage from all causes.
- 3. Permanency of Form. Once it is molded, cured and set the denture does not change its shape.
- 4. Tissue Tolerance. Authorities report that oral tissues are healthier under Luxene Resinoid Dentures.
- 5. Absence of Absorption. It is a permanently dense, homogeneous substance. No moisture can penetrate its lustrous surface.
- 6. Odor and Taste. It is odorless and tasteless. Non-absorbent, it cannot acquire either odor or taste.
- Permanent Adherence. In the mold, it first becomes fluid, surrounds teeth and metal parts, and solidifies into an integral part of denture.
- 8. Curing Time. It cures in $2\frac{1}{2}$ hours at 266° F. in an ordinary vulcanizer.

- 9. Expansion and Contraction. Mouth temperatures will not expand or contract the denture. There is no absorption so it neither swells nor shrinks.
- 10. Length of Life. Its strength and texture do not deteriorate. Original denture dimensions are permanent, Color is durable. It will last indefinitely.
- 11. Cleanliness. It is unaffected by oral secretions, acids, alkalies or alcohol. Soap and water brushing keeps denture hygienic.
- 12. Ease of Repair. Luxene Resinoid Repair is a special form which cures in less time and at lower temperature. Dentures may be rebased or repaired so perfectly that only the closest inspection can detect it.

BAKELITE DENTAL PRODUCTS, Inc.

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LUXENE

"Less than a stone's throw away is the de Young Memorial Museum, which contains nearly a million exhibits from nearly every field of art; and across the Concert Valley, where the band plays on Sundays and holidays, are the Aquarium, and the Academy of Sciences Building with interesting mammal and bird habitat groups representing California and Africa.

"So much for the Park, but we could spend days out there just wandering about, for there's a thousand acres of enchantment in this greatest of man-made parks.

"I recall how you used to delve into history—well, out here in San Francisco you'll have the opportunity to examine at first hand two of this city's most historic landmarks—the Presidio, and the Mission Dolores. You know, the early city, after the Spanish plan of colonization, had three branches: the religious, the military, and the civil, represented here by the Mission, the Presidio, and the Pueblo. The first two still stand, but the third, the pueblo, has grown from a tiny square near the water's edge to the modern, metropolitan city.

"The Government Presidio is only a short distance from the downtown business section of San Francisco. It is the largest military reservation located within a city. Winding highways lead through eucalyptus groves, and every turn in the highway reveals some striking panorama of Bay and distant hills, or the skyline of the

city.

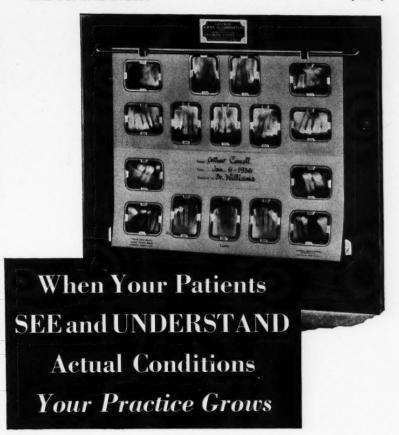
"I'll show you the Officers' Club, standing at the head of the main parade ground. Made of adobe, it is the oldest structure in San Francisco, built shortly after the first settlers arrived in 1776 to build an outpost for the king of Spain.

"Later, we'll drive over to old Mission Dolores, located in the heart of the city. When Father Serra built this mission he selected the best site he could find—on the banks of a little river called Dolores. From that river came the name 'Mission Dolores.' Actually the building is 'Mission San Francisco de Asis.'

"It is a quaint little adobe structure. Inside are vestments worn by the Father Presidente of the California mission chain, altar pieces from Spain, and many other relics.

"The crude rafters overhead were tied in place with leather thongs by the Indian neophytes, then painted in red and blue stripes. The colors, applied more than a century and a half ago, are still visible.

"Alongside the mission is a little (Continued on page 105)



WITH radiographs you can show the patient a complete picture of the actual condition of his teeth. Then your explanation of needed treatment has full significance. Present these important facts in this effective way... Mount the radiographs in Eastman Dental Film Mounts ... Use the Eastman X-ray Illuminator to display them.

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Eastman Dental Film Mounts provide a means of viewing radiographs in correct anatomical order. They are available in 12 different types, holding and framing each radiograph individually. There are single to 18-opening mounts for periapical radio-

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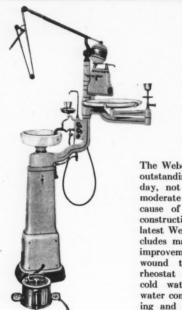
Weber equipment meets every qualification for these new practices. Pleasing lines, beautiful finish and efficient operating facilities are combined with the additional important advantage—moderate price. Weber equipment is the *right* start for the recent graduate.



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porated beauty of line and finish, individuality, chan For the dentist whose patients are accustomed to the material things, Weber equipment has every essential acteristic. The pleasing simplicity of all Weber design graceful lines and beautiful finish, provide Weber equipment a character that is in perfect tone with the finest indefined appointments and furnishings. Built to a quality if Weber equipment reflects the highest standards in equipmed design and construction.



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EXPORT OFFIC 9

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er provides these requisites to a very high degree.

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"There are many other things I'd like to tell you about, Harry, but I'm getting writers' cramp, so I guess I'll have to close for this time. Best wishes to you and the family.

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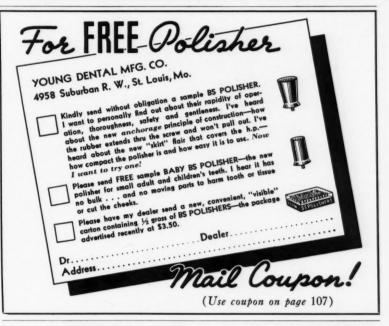
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